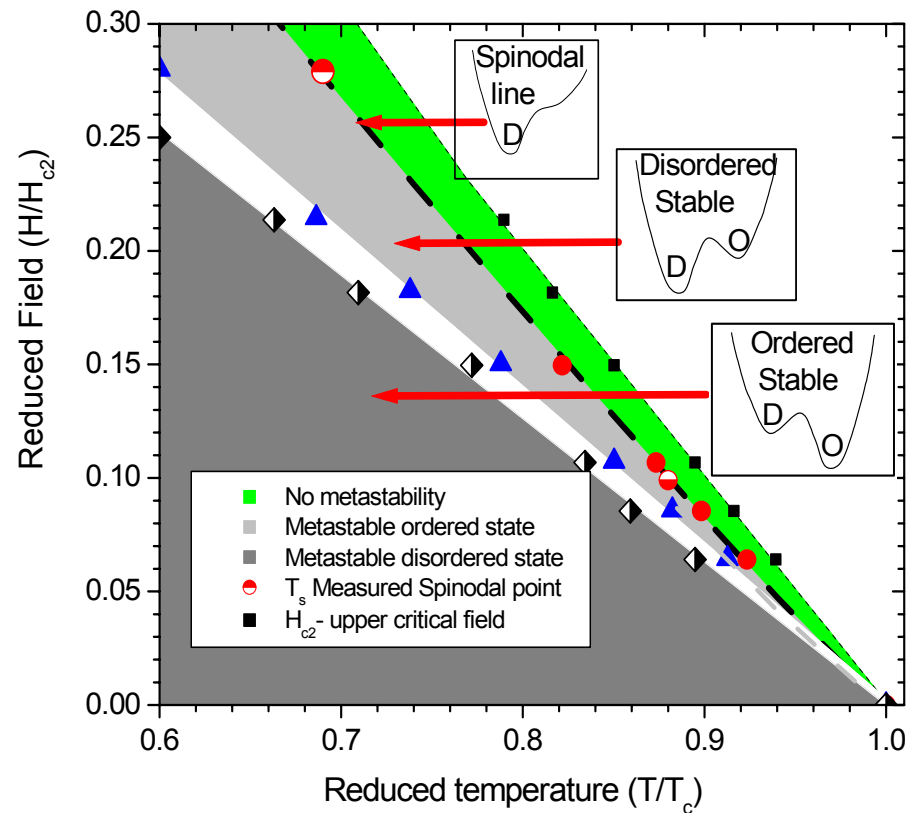


The Vortex Spinodal

Eva Y. Andrei, Rutgers University, DMR-0105389

Most natural systems, ranging from water to living cells exhibit metastability whereby, for the same physical parameters, they can exist in more than one state. The properties of a metastable state can be qualitatively different from those of the stable one. Thus, which one of these states the system finds itself in determines for example whether the bottle in your cooler contains water or ice.

Vortices in superconductors provide a unique system where metastability can be studied in a controlled way. In this work we demonstrate the existence of a spinodal line in the phase diagram of the vortex lattice in a NbSe₂ crystal. Above this line (green region) metastability is no longer present and the properties are uniquely defined by the applied field and temperature.



The Vortex Spinodal

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Education:

Two undergraduate students working on honors projects (Gail Schneider and Adam Hauser), two graduate students (Ozgur Dogru and Ivan Skachko), one postdoc (Guohong Li) and one research associate (Ross Newsome) are actively involved in various aspects of our research.

Outreach:

The PI participated in several recruiting events for women in science and conducts lab visits for high school students during open house days.

